A review of the conservation ecology of Round-leaf Pomaderris *Pomaderris vacciniifolia* F. Muell. ex Reissek (Rhamnaceae)

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Abstract
Round-leaf Pomaderris *Pomaderris vacciniifolia* F. Muell. ex Reissek (Rhamnaceae) is a Victorian endemic shrub listed as threatened under the *Flora and Fauna Guarantee Act* 1988 and critically endangeredunder the Environment Protection and Biodiversity Conservation Act 1999. A review of the available literature for *P. vacciniifolia* indicated most information is anecdotal or found in unpublished works. Better understanding of the ecology of *P. vacciniifolia* may help explain why it is vulnerable, and enhance future management. Future research should focus towards better understanding of *P. vacciniifolia* habitat, reproductive ecology, seed dispersal mechanisms and competitive ability and how these compare with more common sympatric congeners, to determine whether any differences could explain the relative success of these species. Targeted searches for this species on public and private land are warranted to reveal additional populations and fully appreciate the distribution of this species. (*The Victorian Naturalist* **131** (2) 2014, 44–51)

Keywords: Pomaderris vaccinifolia, Rhamnaceae, conservation ecology, threatened species, seed dispersal

Introduction

Within Australia, few studies explicitly explain causes of rarity or uncommonness in plants. Often, there is little other than anecdotal information or unpublished literature available concerning their ecology, which can be difficult to access. This is the case for Round-leaf Pomaderris *Pomaderris vacciniifolia* F. Muell ex. Reissek (Rhamnaceae), a Victorian endemic species. The objective of this paper is to collate available information for *P. vacciniifolia*, to highlight deficiencies in current knowledge and to provide direction for future research.

Pomaderris vacciniifolia (Fig. 1) is a slender shrub with weak spreading branches, growing to a height of 4 m (Walsh 1999; Costermans 2009). Its branchlets are greyish and covered in stellate trichomes, with elliptic to broad-elliptic leaves 8–22 mm long (usually 12–15 mm) and 6–13 mm wide (usually 8–10 mm) (Walsh 1999), with entire margins and an obtuse tip and base (Fig. 2). Stipules are deciduous and 1.5–2 mm long; the upper leaf surface is dark green, smooth, glossy and glabrous; the lower surface is greyish due to a fine, dense layer of minute stellate trichomes, with occasional, larger, rusty, stellate trichomes (Fig. 3). It produces small creamy-white flowers on pedicels 2–3 mm long (Fig. 4), with deciduous sepals 1.5–2 mm long that are pubescent on the lower (outer) surface (Fig. 5), and quickly deciduous spathulate petals to 1.5 mm long (Walsh 1999). Flowers are arranged in axillary, hemispherical or pyramidal panicles, 10–40 mm long and wide. Small

Fig. 1. Population of *Pomaderris vacciniifolia* at Chum Creek, Victoria.

Fig. 2. Lower (a) and upper (b) surface of *Pomaderris vacciniifolia* leaves.

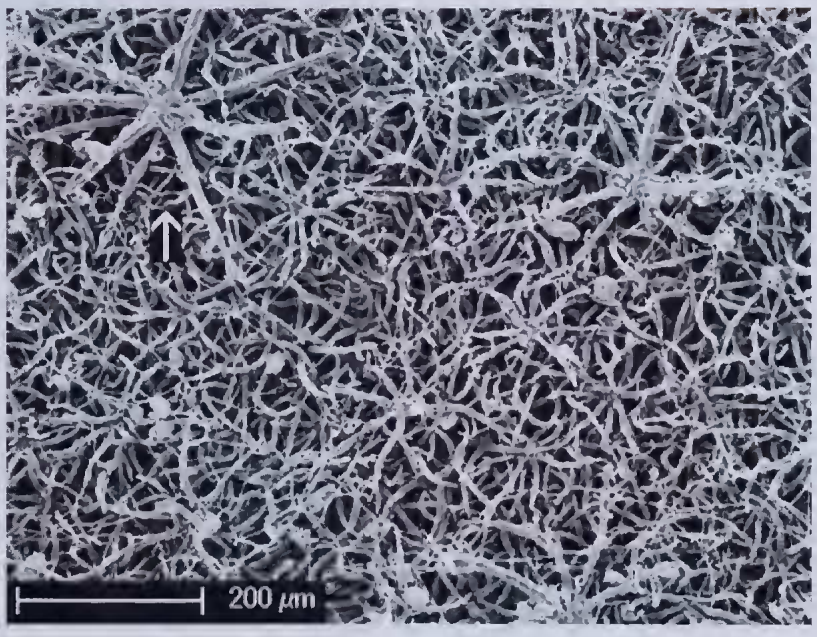

Fig. 3. Scanning electron micrograph of the lower leaf surface of *Pomaderris vacciniifolia* showing a dense covering of minute stellate trichomes, with the occasional larger, rusty stellate trichome (arrowed).

Fig. 4. *Pomaderris vacciniifolia* flowers displaying the (a) pedicel, (b) sepal, (c) petal, (d) stamen and (e) style.

bracts that subtend the flowers are deciduous (Walsh 1999). The calyx below the free part of the sepals is approximately 0.5 mm long. The ovary is half-superior to superior (Walsh 1999) and covered with stellate trichomes. The style is tripartite in the upper part (Fig. 6). Fruits are small, globular capsules to 2 mm wide (Walsh 1999), containing up to three hard, glossy, black seeds (J Patykowski pers. obs.).

Conservation status

Pomaderris vacciniifolia is listed under the *Flora and Fauna Guarantee Act* 1988 as a threatened species. Under the *Advisory List of Rare and Threatened Plants in Victoria* (Department of Sustainability and Environment [DSE] 2005), it is assigned a conservation status of vulnerable. In January 2014, it was listed as critically endangered under the Environment Protection and Biodiversity Conservtion Act 1999.

Geographic distribution

Remaining wild populations of *P. vacciniifolia* predominantly occur in often fragmented stands, throughout damp sclerophyll forest in the upper catchments of the Yarra, Yea and Plenty Rivers in Victoria in an area bounded

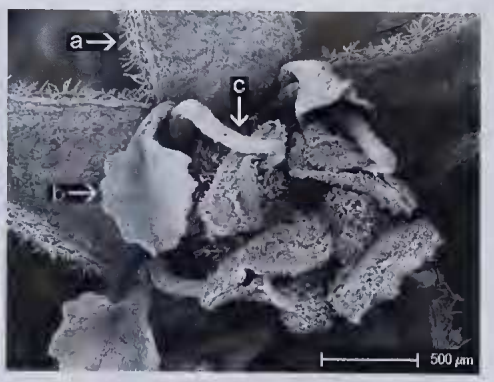

Fig. 5. Scanning electron micrograph of *Pomaderris vacciniifolia* flower showing the (a) glabrous adaxial surface of sepals, (b) petals and (c) stamen. Note the pubescence on the lower (outer) surface of sepals.

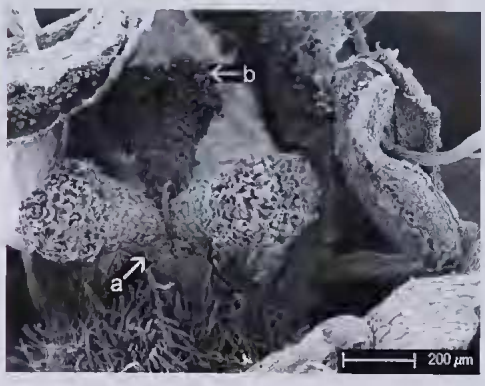

Fig. 6. Scanning electron micrograph of *Pomaderris vacciniifolia* flower showing the (a) tripartite style and (b) stigma.

by Healesville, Flowerdale and Eltham (Walsh 1999; DSE 2013a) (Fig. 7). Historical records indicate *P. vacciniifolia* occurs around Tyers and the Toongabbie–Cowwarr district (DSE 2013a), although records are few and dated, and its current presence requires ground-truthing. A small population was recently discovered at Bunyip Streamside Reserve, in West Gippsland (M Dell pers. obs.). It occurs within the Highlands–Southern Fall, Highlands–Northern Fall, Central Victorian Uplands and Gippsland Plain bioregions.

Remaining wild populations are found on ridgelines in moist forests and on lower slopes in hilly foothill country, extending occasionally into drier forests at lowland sites, elevations ranging from 40 to 550 m (Walsh 1999; Cam-

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Index to

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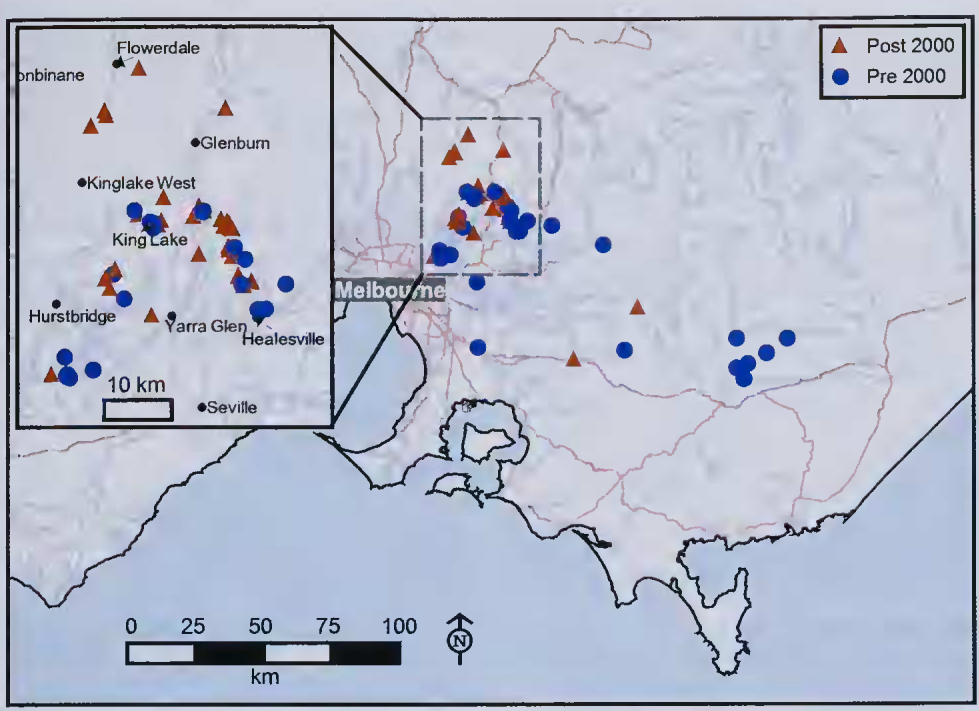

Fig. 7. Distribution of *Pomaderris vacciniifolia* records. Data Source: 'Victorian Biodiversity Atlas' © The State of Victoria, Department of Environment and Primary Industries (2013), and Council of Heads of Australasian Herbaria (2013).

eron 2006; DSE 2013a). Based on its known distribution, *P. vacciniifolia* is generally confined to soils derived from Silurian or Devonian marine sediments (usually sandstone or mudstone), although some lowland populations occur on alluvial soils (Douglas and Ferguson 1988; DSE 2013a).

Optimum conditions for this species appear to occur at elevations above 300 m with 800–1000 mm annual rainfall, where individuals seem to exhibit faster growth, reach reproductive maturity when younger and are longer-lived than plants growing at lower elevations and in drier conditions (Cameron 2006). Ecological Vegetation Class modelling by the DSE (2013) indicates that populations found under these conditions are associated with Damp Forest and Herb-rich Foothill Forest. These Ecological Vegetation Classes (EVCs) include the dominant canopy species Mountain Grey-gum *Eucalyptus cypellocarpa* L.A.S.Johnson, Messmate Stringybark *E. obliqua* L'Her., Narrow-leaf Peppermint *E. radiata* Sieber ex DC. subsp. *radiata* and Manna Gum *E. viminalis* Labill. subsp. *viminalis*. Less optimal habitat occurs on lowland sites of 40 to 300 m elevation, with 650–800 mm annual rainfall. The DSE (2013b) modelled EVCs of these areas are Valley Grassy Forest, Creekline Herb-rich Woodland or occasionally Grassy Dry Forest (DSE 2013b). The dominant tree species for these areas are Broad-leaf Peppermint *E. dives* Schauer, Bundy *E. goniocalyx* F.Muell ex Miq., Red Stringybark *E. macrorhyncha* F.Muell. ex Benth. subsp. *macrorhyncha*, Yellow Box *E. melliodora* Cunn. ex Schauer, Red Box *E. polyanthemos* subsp. *vestita* L.A.S.Johnson and K.D.Hill, or on lower slopes and terraces *E. viminalis* subsp. *viminalis* (Cameron 2006; DSE 2013a). The recently discovered population at Bunyip Streamside Reserve was found growing in the EVC Swampy Woodland (M Dell pers. obs.), which includes the dominant canopy species Swamp Gum *Eucalyptus ovata* Labill. There have been no other